CLAIMS

1. A maraging steel excellent in fatigue characteristics which has a chemical composition consisting essentially of, in % by weight:

C: 0.01% or less,

Ni: 8-19%,

Co: 8-20%,

Mo: 2-9%,

Ti: 0.1-2%,

Al: 0.15% or less,

N: 0.003% or less,

O: 0.0015% or less

and the balance Fe and the Ti component segregation ratio and the Mo component segregation ratio in its structure of 1.3 or less each.

2. A process for producing a maraging steel excellent in fatigue characteristics which comprises:

melting a steel with the composition as described in Claim 1;

casting the molten steel to obtain a steel ingot;

hot forging the steel ingot at a forging ratio of at least 4 for a forged piece;

then submitting to soaking treatment by keeping the forged piece one or more times at a temperature range of 1100-1280°C for a total hot holding time of 10-100 hours; and then plastic working the forged piece.

3. A maraging steel excellent in fatigue characteristics which has a chemical composition consisting essentially of, in % by weight:

C: 0.01% or less,

Ni: 8-19%,

Co: 8-20%,

Mo: 2-9%,

Ti: 0.1-2%,

Al: 0.15% or less,

N: 0.003% or less,

O: 0.0015% or less

and the balance Fe and contains a nonmetallic inclusion in its structure having a size of 30 μm or less when the size of the nonmetallic inclusion is expressed by the diameter of a corresponding circle taking the circumferential length of the nonmetallic inclusion to be the circumference of the corresponding circle.

4. A maraging steel excellent in fatigue characteristics as set forth in Claim 3, further which has the Ti component segregation ratio and the Mo component segregation ratio in its structure of 1.3 or less each.

5. A process for producing a maraging steel excellent in fatigue characteristics which comprises;

melting a steel with the chemical composition as described in Claim 3;

casting the molten steel to obtain a steel ingot of a taper Tp = (D1 - D2) × 100/H of 5.0-25.0%, a height-diameter ratio Rh = H/D of 1.0-3.0, and a flatness ratio B = W1/W2 of 1.5 or less, taking the diameter of a corresponding circle with a circumference corresponding to the circumferential length of the top of the steel ingot as D1, the diameter of a corresponding circle with a circumference corresponding to the circumferential length of the bottom of the steel ingot as D2, the height of the steel ingot as H, the diameter of a corresponding circle with a circumference corresponding to the circumferential length of the steel ingot at a location of H/2 as D, and the length of the long side and length of the short side of the steel ingot at a location of H/2 as W1 and W2, respectively;

and plastic working the steel ingot to make the size of a nonmetallic inclusion in the steel be 30 μm or less when the size of the nonmetallic inclusion is expressed by the diameter of a corresponding circle taking the circumferential length of the nonmetallic inclusion to be the circumference of the corresponding circle.

6. A process for producing a maraging steel excellent in fatigue characteristics which comprises;

melting a steel with the chemical composition as described in Claim 3;

casting the molten steel to obtain a steel ingot with the taper Tp, the height-diameter ratio Rh, and the flatness ratio B as described in Claim 5;

forging the steel ingot at a forging ratio of at least 4 for a forged piece;

then submitting to soaking treatment by keeping the forged piece one or more times in a temperature range of 1100-1280°C for a total hot holding time of 10-100 hours;

and then plastic working the forged piece to make the size of a nonmetallic inclusion in the steel be 30 μm or less when the size of the nonmetallic inclusion is expressed as described in Claim 5.